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(71) Applicant (for all designated States except US):  
**THOMAS INDUSTRIES INC.** [US/US]; 1419 Illinois Avenue, Sheboygan, WI 53082 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **LYNN, William, Harry** [US/US]; 911 Bayberry Lane, Kohler, WI 53044 (US). **FUKSA, Richard, C.** [US/US]; 1316 North Good St., Park Ridge, IL 60068 (US).

(74) Agent: **FRANZINI, John, D.**; Quarles & Brady LLP, 411 E. Wisconsin Avenue, Milwaukee, WI 53202 (US).

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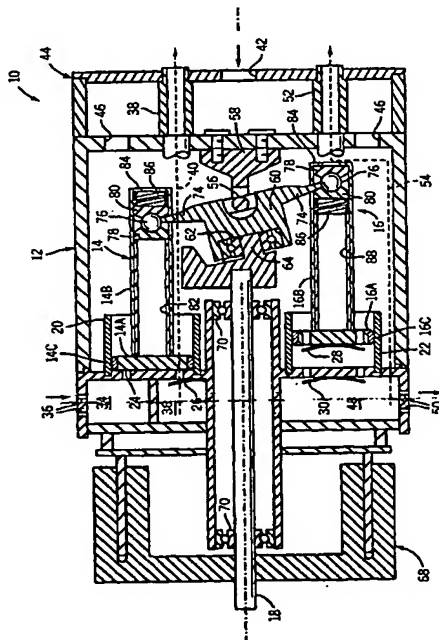
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(54) Title: HYBRID NUTATING PUMP



(57) Abstract: A nutating pump has a cross-type universal joint connecting a nutating member to a pump housing, ball joints connecting the nutating member to piston rods, and the piston rods fixed to piston heads so that the piston heads wobble in pump cylinders.



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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/19467

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : F01B 13/04

US CL : 92/12.2

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 92/12.2, 71; 91/499; 74/60

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
nutating, pump, piston, swash, wobble, ball, socket, spherical, bearing

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2003/0002990 A1 (REITZIG) 02 January 2003 (02.01.2003), figure 4.	1,10
Y	US 6,450,777 B2 (LYNN et al.) 17 September 2002 (17.09.2002), figures 3 and 6	1,10
A	US 6,439,857 B1 (KOELZER et al.) 27 August 2002 (27.08.2002), figure 3	2, 4, and 5
A	US 5,079,996 A (ABOUSABHA et al. ) 14 January 1992 (14.01.1992), figure 1	2, 4, and 5
A	US 5,007,385 A (KITAGUCHI) 16 April 1991 (16.04.1991), figure 5	1, 2, 4, and 5
A	US 4,934,253 A (BERTHOLD et al.) 19 June 1990 (19.06.1990), figure 1	1, 2, 4, and 5

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

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Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Facsimile No. (703) 305-3230

Authorized officer

Thomas E. Lazo

Telephone No. 703-308-0975